

I. General Remarks Concerning This Response

Claims 1-20 are currently pending in the present application. No claims have been amended, added, or canceled. Reconsideration of the claims is requested.

5 In response to a persuasive argument in Applicant's appeal brief, the pending Office action has re-opened prosecution of the present patent application by withdrawing the finality of the previous Office action.

10 II. Summary of Present Invention

The present invention is a method for deferred deletion of entries in a directory service backing store. Although shown as a preferred embodiment within the specification, the invention is not limited to a Lightweight Directory Access Protocol (LDAP) directory service provided with a DB/2 backing store. As stated
15 in the specification, the principles of the present invention may be practiced in other types of directory services, e.g., X.500, and using other relational database management systems, e.g., Oracle, Sybase, Informix, etc., as the backing store.

20 In either the present invention or the prior art, an entry in an LDAP directory is deleted using an SQL statement. In the prior art, the directory server responds to the delete entry statement by instituting a global lock on the database tables to ensure that data in those tables cannot be modified while the
25 entry is being deleted from the directory. In contrast, the present invention provides an enhanced delete operation whereby the entry is marked for deletion, and the actual deletion is completed at a later time.

More specifically, the present invention is a method for
30 deleting an entry from a directory in which directory information is stored in a set of database tables; the deletion is initiated in response to a request to delete a directory entry. In response, the directory entry is tagged in some manner as being a

deleted entry, preferably by setting the entry's creation time to a null value. If a search query is received thereafter, the method excludes tagged entries from search results that would otherwise satisfy the search query. At a periodic interval, the routine then searches for tagged entries, and references to the tagged entries are then deleted throughout the set of database tables. In this manner, the completion of the entry deletion operation is deferred to enable directory queries to be processed even if deleted entries have not yet been fully expunged from the directory.

III. 35 U.S.C. § 103(a)-Obviousness-Serbinis et al.

The Office action has rejected claims 1-12 and 15-20 under 35 U.S.C. § 103(a) as unpatentable over Serbinis et al., "Internet document management system and methods", U.S. Patent No. 6,584,466 B1, filed 04/07/1999, issued 06/24/2003. (As explained hereinbelow, this ground of rejection should state that claims 1-13 and 16-20 are rejected over Serbinis et al. because the Office action contains a minor error in the listing of the claim numbers.) This rejection is traversed.

All of the pending claims have been rejected, at least in part, over the disclosure in Serbinis et al.; each of the independent claims has one or more common elements against which the rejections apply portions of Serbinis et al.. However, Applicant asserts that there is at least one element of each independent claim that is neither shown nor suggested in Serbinis et al., thereby causing these obviousness rejections to be deficient, as argued in more detail hereinbelow.

A majority of the Office action relies on the reasoning and the arguments that are made in the obviousness rejection of independent claim 1. Independent claim 1 reads as follows:

1. A method for deleting entries from a directory in which directory information is stored in a set of database tables, comprising the steps of:

receiving a request to delete a directory entry;
responsive to receiving the request to delete a
directory entry, determining to tag the directory entry for
subsequent deletion by setting an attribute of the directory
entry to a predetermined value;
5 updating a first database table storing the attribute
of the directory entry;
periodically searching for tagged directory entries in
the first database table during a cleanup process interval;
10 and
deleting references to the tagged directory entries
throughout the set of database tables.

The first part of the rejection of claim 1 states that
15 Serbinis et al. anticipates the first element of claim 1 at
column 7, lines 63-67, which reads as follows from column 7, line
63, to column 8, line 4:

In a preferred embodiment, documents stored in the DMS
system are monitored by a document state process that
20 automatically modifies the state of a document instance
based on its current state, the active date/time, and
expiration date/time. States for a document instance
include "pending", "active", "archived", "canceled", and
"deleted". Each default state change in a document instance
25 is logged to the DMS database, and may result, for example,
in a billable transaction.

Hence, the fact that Serbinis et al. discloses a "deleted" state
for a document is not disputed. However, as explained in more
30 detail further below, Serbinis et al. does not disclose the
receipt of a request to perform a delete operation, as required
by the language in the first element of claim 1, because the
"deleted" state is entered automatically.

The second part of the rejection of claim 1 states that
35 Serbinis et al. anticipates the second element of claim at column
18, lines 16-25, which reads as follows:

If the interval has been exceeded, the user session is
rendered inactive at step 202 and a flag to that effect is
entered in the corresponding database entry. The process is
40 repeated at step 203 for each active session. Alternatively,
a user forced logout/exit may also render a user session
inactive and the corresponding database entry is flagged
accordingly.

Notification Processes

Referring now to FIGS. 12A and 12B, the notification request and confirmation services available on a preferred embodiment of DMS system 17 are described. Notification messages are generated by notification server 35 in response to various user events.

Although this portion of Serbinis et al. discloses that a flag is set within a database entry, it is unclear why this portion is applied against the second element of claim 1 because Serbinis et al. merely discloses that this step occurs when a user session becomes inactive. In contrast, the language of the second element of claim 1 requires that a directory entry is determined to be tagged in response to the receipt of a deletion request. In other words, the portion of Serbinis et al. that was applied by the rejection against the second element of claim 1 appears to be irrelevant.

The third part of the rejection of claim 1 states that Serbinis et al. anticipates the third element of claim 1 at column 8, lines 16-18. Given that the third element of claim 1, i.e. "updating a first database table storing the attribute of the directory entry", is a step to support the fourth and fifth elements of claim 1, and given that the rejection applies the same portion of Serbinis et al. against the fourth and fifth elements as it does against the third element, Applicant continues the analysis of the rejection with respect to those elements.

The fourth part of the rejection of claim 1 states that Serbinis et al. anticipates the fifth element of claim 1, i.e. "deleting references to the tagged directory entries throughout the set of database tables", at column 8, lines 16-18, which reads as follows:

Document instances marked "archived" are accessible only to the Originator. The state of these documents is changed to "deleted" after a pre-determined amount of time.

Although Serbinis et al. may disclose a deletion operation on document at some point in time, the present invention does not simply perform its deletion operation at any given point in time. The present invention performs the deletion operation after the step that is recited in the fourth element of claim 1. The rejection does not give any weight or consideration to the fact that the fifth element of claim 1 contains the term "the tagged directory entries", which is introduced in the fourth element of claim 1; the present invention determines the tagged directory entries in the step that is recited as the fourth element of claim 1, i.e. "periodically searching for tagged directory entries in the first database table during a cleanup process interval", and these tagged directory entries are then deleted during the step that is recited in the fifth element of claim 1. In other words, the rejection analyzes the process steps of the present invention out-of-order, which is particularly important because the rejection admits that Serbinis et al. does not disclose the fourth element of claim 1. Hence, the rejection admits that Serbinis et al. does not disclose a periodic search operation to determine a set of tagged directory entries, as required by the claim language. Applicant asserts, therefore, that it is not possible for Serbinis et al. to disclose nor suggest the fifth element of claim 1, wherein the tagged directory entries that were previously determined are then deleted.

More importantly, Applicant asserts that the disclosure in Serbinis et al. does not provide any suggestions to one having ordinary skill in the art for modifying Serbinis et al. to reach the present invention, notwithstanding the argument in the rejection to the contrary. The rejection admits that Serbinis et al. does not disclose the fourth element of claim 1, and the rejection provides an obviousness argument for a manner in which

Serbinis et al. could have been modified to reach the present invention. The rejection states at the bottom of page 2:

Serbinis does not explicitly teach periodically search [sic] for tagged directory entries in the first database table during a cleanup process interval. However, Serbinis' system needless to use the search [sic] to gather the tagged entries in order to perform the same functionalities according to the present invention because the tagged records would be deleted in the pre-determined amount of time (time expiration) (col. 8, lines 16-20). Therefore, one ordinary skill [sic] in the art would recognize the advantage of using the Serbinis' database management system with reduce searching step [sic] to achieve the same goal as the claimed invention.

The rejection apparently argues that the fact that Serbinis et al. discloses a time-expiration period on an "archived" document instance, which changes the state of the document to a "deleted" document, somehow provides a suggestion or a motivation to modify the system that is disclosed in Serbinis et al. to reach the claimed invention. Applicant strongly disagrees. The fact that a deletion operation occurs automatically at the end of an expiration period, as taught in Serbinis et al., is not equivalent to the present invention nor does it suggest the present invention in which the actual deletion of a directory entry is delayed or postponed by tagging the directory entry for subsequent deletion and then deleting references to the directory entry at some later point in time.

Moreover, Applicant argues that the rejection misinterprets the teachings of Serbinis et al., which teaches the following at column 8, lines 10-25:

Document instances marked "active" are accessible by all Authorized Users. If a document instance has an expiration time, then the status is changed from "active" to "archived" when the expiration time is reached. At this point, document instance rights are removed from all Authorized Users except the Originator.

Document instances marked "archived" are accessible only to the Originator. The state of these documents is changed to "deleted" after a pre-determined amount of time. At this time, the physical file corresponding to the document instance is removed/deleted from storage and the corresponding document store record is deleted. Document instances marked deleted are only available for tracking and billing purposes. These document instances are removed from DMS database 25 only when the corresponding transaction log is billed and removed from database 25.

It should be apparent by reference to the above-copied portion of Serbinis et al. that the rejection does not make any distinction between a document instance, a document instance record, and a document store record, as discussed with Serbinis et al., because Serbinis et al. discloses immediate deletion. The rejection applies the portion of Serbinis et al. at column 8, lines 16-18, against the fifth element of claim 1, and this portion of Serbinis et al. clearly states that the document instance is deleted when the document is changed from the "archived" state to the "deleted" state: "The state of these documents is changed to 'deleted' after a pre-determined amount of time. At this time, the physical file corresponding to the document is removed/deleted from storage and the corresponding document store record is deleted." Thus, Serbinis et al. does not disclose a delayed or postponed deletion operation through the use of tagged entries, as is disclosed in the present patent application, because Serbinis et al. discloses deletion at the point in time that the document is changed to a "deleted" state.

Applicant also asserts that the motivation statement in the obviousness rejection appears to be illogical and also appears to support Applicant's argument; the rejection appears to present a self-refuting argument against an obviousness rejection of claim 1 over Serbinis et al.. The rejection states: "Serbinis' system needless to use the search [sic] to gather the tagged entries in order to perform the same functionalities according to the present invention because the tagged records would be deleted in

the pre-determined amount of time (time expiration)". It appears that the rejection argues that the system that is disclosed in Serbinis et al. would not need to perform a search for tagged entries, i.e. entries that were tagged for deletion but not previously deleted, because "the tagged records would be deleted in the pre-determined amount of time (time expiration)", i.e. the documents would have been deleted when they were given a "deleted" status at the expiration time. Hence, the rejection appears to provide an argument against the obviousness of modifying Serbinis et al. to create a system as taught by the present patent application.

In addition, the motivational statement continues by stating that the system that is disclosed in Serbinis et al. not only achieves "the same goal as the claimed invention" but also has an advantage because it has a "reduce searching step", i.e. there is no need ("needless") to perform a searching step. Although these points may be true, the argument is surprising and illogical because the goal of an obviousness rejection should be to explain how the prior art teaches or suggests the same invention as is claimed by the present patent application, not some different invention that hypothetically has fewer processing steps or fewer structural elements. Applicant asserts that the rejection has admitted that Serbinis et al. not only does not disclose or suggest the present invention but also teaches away from the present invention.

Furthermore, Serbinis et al. does not discuss, mention, or otherwise disclose a directory, directory entries within a directory, nor a directory service, as required by the claim language of the present patent application; independent claim 1 is directed to "a method for deleting entries from a directory", yet the applied prior art reference does not even mention nor suggest any type of directory, much less an LDAP directory. It is important to note that all of the claims in the present

application are directed to a directory service or a method or a computer program product that involves a directory, but Serbinis et al. does not mention a directory or a directory service even once, even though it has been used as a sole or primary prior art reference. Although Serbinis et al. may disclose a database management system, it is not necessarily the case that the system disclosed in Serbinis et al. inherently includes a directory service. Serbinis et al. does not disclose a directory nor a directory service, so it is not possible for Serbinis et al. to disclose the elements "responsive to a request to delete a directory entry" or "tagging the directory entry in a first table" as recited in independent claim 1. Moreover, a directory or directory service is mentioned in multiple elements throughout all of the claims of the present application. Since the rejection have not addressed this aspect of the claimed invention, the rejections are deficient for ignoring elements of the claimed invention.

With respect to dependent claims 2 and 3, the rejection states that the feature of tagging an entry by setting its creation time attribute to a given value (claim 2) or to zero (claim 3) is disclosed in Serbinis et al. with a state on a document instance that includes an active date/time or an expiration date/time. Applicant asserts that it should be clear that these features in Serbinis et al. are not equivalent to the claimed features.

With respect to dependent claim 4, the rejection appears to continue the illogical argument that was started in the motivational statement of the rejection of claim 1. In fact, it is very difficult to decipher the language in the rejection of claim 4, which states in its entirety on page 3:

Regarding on claims 4 and 17, Serbinis teaches performing a search for directory entries that satisfy a search query; and excluding tagged directory entries from search results that otherwise satisfy the search query.
5 Serbinis' system does not need performing a search for directory entries that satisfy a search query; and excluding tagged directory entries from search results that otherwise satisfy the search query because Serbinis' system would have expiration time which would be deleted from the data
10 storage. Moreover, the limitation as indicated above is know in the art because one of the searching's technique is to retrieve the wanted record or unwanted record but not all. That the reason why the excluding tagged directory entries from a search results that otherwise satisfy the
15 search query, otherwise excluding tagged directory have other usages. That needs to bring into the language of the claim to clarify the novelty of the invention.

It is unclear what is technically meant by the phrase: "Serbinis' system would have expiration time which would be deleted from the
20 data storage." It is unclear what is technically meant by the phrase: "... one of the searching's technique is to retrieve the wanted record or unwanted record but not all." It is unclear what is technically meant by the phrase: "That the reason why the
25 excluding tagged directory entries from a search results that otherwise satisfy the search query, otherwise excluding tagged directory have other usages." It appears that the rejection is rephrasing the argument in the motivational statement from the rejection of claim 1. However, it is also unclear what is meant
30 from a patent examining perspective for the phrase "that needs to bring into the language of the claim to clarify the novelty of the invention."

With respect to dependent claim 5, the rejection states that Serbinis et al. discloses modifying an SQL query at column 5,
35 lines 50-61. However, Serbinis et al. does not mention an SQL query at all.

With respect to dependent claim 6, the rejection states that Serbinis et al. discloses an LDAP directory service at column 5,

lines 50-61. However, Serbinis et al. does not mention an LDAP directory service at all.

Dependent claims 7 and 8 recite further limitations. Since the dependent claims incorporate the features of independent claim 1, the rejections are similarly deficient with respect to the dependent claims for the same reasons that were argued above with respect to independent claim 1.

With respect to independent claims 9, 16, and 19 and their dependent claims, the rejection relies on the rejection of claim 1 and the rejection of claims 2-8. Applicant asserts that Applicant's arguments above with respect to claims 1-8 are applicable against the rejection of claims 9-13 and 16-20.

Examiner bears the burden of establishing a *prima facie* case of obviousness

The examiner bears the burden of establishing a *prima facie* case of obviousness based on the prior art when rejecting claims under 35 U.S.C. § 103. *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992). Only when a *prima facie* case of obviousness is established does the burden shift to the applicant to produce evidence of nonobviousness. *In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Rijckaert*, 9 F.3d 1531, 1532, 28 U.S.P.Q.2d 1955, 1956 (Fed. Cir. 1993). If the Patent Office does not produce a *prima facie* case of unpatentability, then without more the applicant is entitled to grant of a patent. *In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Grabiak*, 769 F.2d 729, 733, 226 U.S.P.Q. 870, 873 (Fed. Cir. 1985). In response to an assertion of obviousness by the Patent Office, the applicant may attack the Patent Office's *prima facie* determination as improperly made out, present objective evidence tending to support a conclusion of nonobviousness, or both. *In re Fritch*, 972 F.2d 1260, 1265, 23 U.S.P.Q.2d 1780, 1783 (Fed. Cir. 1992).

Serbinis et al. clearly fails to show or to suggest more than one feature of the present invention as currently claimed by the present patent application, thereby rendering Serbinis et al. incapable of being used as a prior art reference, notwithstanding the rejections by the Office action,. Hence, the rejection of the claims cannot be based upon the cited prior art to establish a *prima facie* case of obviousness. Therefore, a rejection of the claims under 35 U.S.C. § 103(a) has been shown to be insupportable in view of the cited prior art, and the claims are patentable over the applied references. Applicant respectfully requests the withdrawal of the rejections of the claims.

IV. 35 U.S.C. § 103(a)—Obviousness—Bharwani

The Office action has rejected claims 13 and 14 under 35 U.S.C. § 103(a) as unpatentable over Bharwani et al., "Method for information storage and retrieval", U.S. Patent Number 3,670,310, filed 09/16/1970, issued 06/13/1972. This rejection is traversed.

It should be noted that claim 14 is an independent claim, and claim 15 is its dependent claim; dependent claim 13 depends from independent claim 9. Thus, it appears that the Office action has an error in citing claims 13 and 14 in the above-noted grounds of rejection. Applicant argues as if the grounds of rejection should state that claims 14 and 15 are rejected together; a corresponding error was made in the Office action's other grounds of rejection.

In a manner similar to that argued above by Applicant with respect to Serbinis et al., Bharwani et al. does not disclose a directory service nor a directory entry, which are recited within independent claim 14, e.g., "responsive to a search for directory entries that satisfy the search query" in the second element of claim 14. The rejection of dependent claim 15 states that Bharwani et al. discloses an LDAP directory service in Figures 5A

and 5B, but these figures merely show indexing tables. In fact, the entire concept of directories was not yet invented when Bharwani et al. was issued as a patent reference; thus, it is not possible to argue that Bharwani et al. discloses or suggests the claim elements of the present invention.

Bharwani et al. clearly fails to show or to suggest more than one feature of the present invention as currently claimed by the present patent application, thereby rendering Bharwani et al. incapable of being used as a prior art reference, notwithstanding the rejections by the Office action,. Hence, the rejection of the claims cannot be based upon the cited prior art to establish a *prima facie* case of obviousness. Therefore, a rejection of the claims under 35 U.S.C. § 103(a) has been shown to be insupportable in view of the cited prior art, and the claims are patentable over the applied references. Applicant respectfully requests the withdrawal of the rejections of the claims.


V. Conclusion

It is respectfully urged that the present patent application is patentable, and Applicant kindly requests a Notice of Allowance.

For any other outstanding matters or issues, the examiner is urged to call or fax the below-listed telephone numbers to expedite the prosecution and examination of this application.

DATE: August 27, 2004

Respectfully submitted,



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